



Denise Neudecker

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A different kind of culture shock

One might think that postdoc Denise Neudecker's move from her native Austria to the United States would have taken a fair amount of adjustment, but the geographical transition proved less of an eye-opening experience than evolving from working in a purely theoretical scientific environment to including experimental exposures and partnerships.

"Vienna, where I attended high school and then went to college, looks quite different from Los Alamos," Neudecker says, "but neither speaking English nor functioning in a scientific setting were foreign to me by the time I arrived in New Mexico. While the coursework during my high-school and undergraduate years had been in German, my Viennese high school included students from a variety of international backgrounds, and all of the scientific articles for my PhD in physics were in English."

Hofburg Palace in Vienna, Austria, which Neudecker regularly passed by on her way home.

During the last year of Neudecker's PhD program, an East Indian graduate student joined the university research team that Neudecker belonged to, and from this moment on the group language became English. Neudecker also collaborated with international researchers, and the email correspondence was in English as well.

The biggest "culture shock" for Neudecker was to begin working with experimental colleagues after she arrived in Los Alamos. She specializes in nuclear data evaluation—the integration of nuclear experimental data and nuclear theory—but until joining Los Alamos solely worked with nuclear theorists.

"The first time I joined one of Los Alamos' experimentalist meetings," Neudecker says, "I made myself a long list of professional terms that I was not familiar with and wanted to look up afterwards."

The Laboratory is special to her, because it allows her to interact with a wide variety of experts in her field.

The advantages of a big research institution

"At Los Alamos all the right people and infrastructures are in one place," Neudecker explains. "You have applications folks here who design and build the nuclear hardware

and software; experimentalists who do the fundamental nuclear physics experiments; theoreticians who propose theoretical models and predict the experimental outcomes; and statisticians who help with the data analysis. Collaborations by email are nice, but being able to walk into someone's office or research station is a very different thing."

Neudecker and Physics Division experimental scientist Hye Young Lee. In the background are neutron detectors covered with aluminum foil and a central beam-pipe leading to a fission counter.

Working with the Laboratory's nuclear experimentalists provides Neudecker with insights into their research, and she also looks to the experimentalists to shed light on previous approaches to nuclear experiments.

"Nuclear data evaluators sometimes look at old experiments in order to better understand how the data came about—what the researchers did or did not do and maybe should have done differently," Neudecker says. "This process of digging up long-ago research papers and second-guessing past activities reminds me of archaeologists analyzing the remnants of ancient civilizations. On rare occasions, you might even sit over an old journal and wonder whether the data points are really experimental results or just specks of ink."

Neudecker laughs. "I'm part of a cutting-edge scientific discipline, but I'm also very interested in what took place before my time. Today's experimentalists often can provide vital clues to the data as such or to any discrepancies between different data sets."

Unexpected choice

Back in Austria, everyone, including Neudecker, had been greatly surprised when Neudecker selected physics as her undergraduate major, especially since her initial passions had belonged to the piano and literature.

Austria's

Wachau valley region, close to where Neudecker is originally from.

"Choosing physics is still rather unusual for Austrian women," says Neudecker shyly. "Nobody was upset, for example, when some of my girl-friends did not excel in math. After all, they were girls, and, according to traditional opinion, girls are not good at math and the natural sciences."

But there were signs to the contrary. While in high school, Neudecker used her spare time to read about the evolution of planets, and she finished at the top of her high-school physics class.

What really attracted Neudecker to a future science career were her first small research projects in Vienna. "Questions that have not been answered yet—or that have been answered unsatisfactorily—have an addictive quality, even if your own contributions seem small," Neudecker notes. "You are out in an open field laden with hidden obstacles, so to speak, and have to find an unknown solution or destination. The discoveries take on added levels of importance and fun if you work with a group of scientists who, collectively, try to solve humanity's major problems, such as the world's energy challenges."

Neudecker works for the Theoretical Division's Nuclear and Particle Physics, Astrophysics and Cosmology group.

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